

applying a pressure to a semiconductor assembly by at least one support pin so as to cause a stress in a lead frame, and sealing the semiconductor assembly with a resin injected into a cavity from a resin injection port of a mold, the stress caused in the lead frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, as recited in claim 1, and as similarly recited in claim 12. The 282 Patent, whether alone or in combination with the 268 Patent, also does not disclose or suggest a molding device for a semiconductor device including, inter alia, an actuator which moves a support pin in a direction of the axis of the support pin such that during injecting the resin into the cavity the support pin applies a pressure to the semiconductor assembly so as to cause a stress in the lead frame, the stress caused in the lead frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, as recited in claim 15.

The March 11, 2003 Advisory Action asserts that the pin support structure of the 282 Patent provides some stress on the lead frame. However, the stress in the lead frame of the 282 Patent does not prevent the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity.


For at least these reasons, it is respectfully submitted that claims 1, 12 and 15 are patentable over the applied references. The dependent claims are likewise patentable over the applied references for at least the reasons discussed as well as for the additional features they recite. Applicant respectfully requests that the rejections under 35 U.S.C. 102 and 103 be withdrawn.

II. Conclusion

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Benjamin M. Halpern
Registration No. 46,494

JAO:BMH/vgp

Date: March 19, 2003

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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APPENDIXIN THE CLAIMS:

Claims 1, 12 and 15 have been amended as follows:

1. (~~Thrice~~~~Twice~~ Amended) A method of manufacturing a semiconductor device comprising:

placing a semiconductor assembly in which a semiconductor chip is secured to a die pad of a lead frame in a cavity of a mold;

applying a pressure to the semiconductor assembly by at least one support pin so as to cause a stress in the lead frame;

sealing the semiconductor assembly with a resin injected into the cavity from a resin injection port of the mold, ~~the pressure applied by the at least one support pin~~ the stress caused in the lead frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity; and

pulling the support pin from the cavity into the mold before the resin is cured to release the semiconductor assembly from the pressure applied by the support pin.

12. (~~Thrice~~~~Twice~~ Amended) A method of manufacturing a semiconductor device comprising the steps of:

supporting a heat radiator placed in a cavity of a mold with at least one support pin;

placing a die pad of a lead frame to which a semiconductor chip is secured on the heat radiator;

closing the mold;

applying a pressure to the heat radiator by at least one support pin so as to cause a stress in the lead frame;

injecting a resin into the cavity from a resin injection port, ~~the pressure applied by the at least one support pin~~ the stress caused in the lead frame preventing the heat radiator from being lifted up or pushed down by the resin when the resin is injected into the cavity; and

pulling the support pin from the cavity into the mold before the resin is cured to release the heat radiator from the pressure applied by the support pin.

15. (~~Thrice~~^{Twice} Amended) A molding device for a semiconductor device comprising:

a mold which is capable of being opened or closed and is provided with a cavity for placing a semiconductor assembly which comprises a semiconductor chip secured to a die pad of a lead frame;

a resin injection port provided to the mold for injecting a resin into the cavity;

at least one support pin provided in the cavity such that the support pin is able to enter into or be pulled out of the cavity to come in contact with the semiconductor assembly in the cavity; and

an actuator which moves the support pin in a direction of the axis of the support pin such that during injecting the resin into the cavity the support pin applies a pressure to the semiconductor assembly so as to cause a stress in the lead frame, ~~the pressure applied by the at least one support pin~~ the stress caused in the lead frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, and such that the support pin releases the semiconductor assembly from the pressure applied by the support pin after the resin is injected before the resin is cured.